NOTES ON SOME ARACHNIDS FROM OHIO VALLEY CAVES.[1]

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In September, 1909, immediately after the expiration of my year at the Indiana University's Cave Farm,[2] I spent two weeks collecting arachnids in the following caves: Marengo, Spring, Wyandotte, Little Wyandotte, Sibert's Well, Saltpeter and Mammoth Cave. In all these caves 268 individuals were caught. The expenses in part were defrayed by a grant from the American Association for the Advancement of Science.

Linyphia Weyeri Emerton[3] was taken only from Marengo Cave. This species in this cave is as abundant as *Troglohyphantes* (*Willibaldia*) *cavernicola* Keys. is in the Shawnee Cave. They are most abundant at a place 200 feet from the old entrance, or 500 from the new one. None were seen farther that 1,200 feet from the old entrance. Insects from this locality to the end of the cave are very rare, while near the entrance they are very abundant. The habitat, habits, webs and cocoons of this spider are similar to those of *Troglohyphantes*. Some were collected on their snares in the angles formed by the floor and wall, some along clay banks, some in little pits in the sand floor, and others under rotten boards and débris with thysanurans, beetles, diptera and myriopods. They were not sensitive to my carbide light, but were easily irritated by blowing on the web. The snares were quite abundant and were constructed like those of *Troglohyphantes*. Several cocoons were collected; one contained newly hatched spiderlings which were white in color. One spider was caught eating a thysanuran. Since the entrance to this cave is an artificial one securely made in a sink hole, we may expect an even temperature throughout the cave. And since the spiders are most abundant near the entrance we may attribute this phenomenon to the great number of insects.

[1] Contribution No. 117 from the Zoölogical Laboratory of Indiana University.

[2] "Biology of the Shawnee Cave Spiders," BIOL. BULL., Vol. XIX., No. 6, November, 1910.

[3] These various species were identified by Dr. Alexander Petrunkevitch.

Phanetta subterranea Emerton.—A few were collected 300 feet from the entrance of Spring Cave (a wet cave one fourth mile west of Marengo Cave). These were found under flat rocks and rotten boards on the floor in damp places. They were in company with thysanurans. Several were caught in all parts of Little Wyandotte; however, none nearer the entrance than 75 feet. A few of these were observed under flat stones, but most of them were seen on the base, or in the cracks of stalagmites. Those on the base were usually running about, while those in the cracks were hanging to the underside of their tiny webs.[1] The snare is a flat sheet. It generally droops a little in the center. The meshes are very minute and the number of attachment threads depends on the surroundings. This species is a swift runner and the young are entirely white. Small diptera, thysanurans and myriopods were rather plentiful. This arachnid was abundant in Saltpeter Cave under flat rocks in moist places. They could not be affected by carbide light. Diptera and thysanurans were common.

Anthrobia mammouthia Tellkampf was found only in Mammoth Cave. Eleven specimens were caught. Since I had to keep in company with a crowd of cave visitors who were led by a guide, I was unable to stop more than one or two minutes at a place. However, I found specimens at various localities and undoubtedly they may be taken at any place in the cave where there is sufficient moisture. They were always found under flat rocks, on old mouldy paper and among débris. One small white, disk-like cocoon was observed under a flat stone. These spiders are rather active, not fast runners, and are not difficult to catch for they cling tightly to the rocks and to one's fingers. They vary in color from white to a light brown.[2] In most places insect life seemed to be comparatively scarce. Perhaps these arachnids eat old mouldy paper, remains of lunch and the limited number of small insects.

Meta menardi Latreille.—They are rather common at the mouth of Spring Cave. One was observed in Saltpeter Cave and five were caught at the end of the main channel in Mammoth

[1] Blatchley says these are wandering spiders and spin no webs. "Indiana Caves and their Fauna," Rep. Ind. Geol. Surv., XXI., p. 204.

[2] Hitherto they have always been described as being only white.

Cave. According to the guide this locality is two and one half miles from the entrance. Concluding from the number of webs at this place, *Meta* must be common. Since *Meta* is an outside form and is ordinarily never found very far from the entrance of a cave, there is evidently an opening somewhere near this place. Here as elsewhere in this cave, cave crickets, small diptera and blind beetles were often seen.

Scotolemon flavescens Cope.—This cave harvestman was very abundant in Wyandotte. They were found some distance from the entrance on the damp floor where visitors walk, and often at the base of damp stalagmites. They were always found in the same places as thysanurans and where candle drippings were common. They probably eat the candle drippings and each other, for three couples were seen fighting and several were found dead. They are the least active arachnids I have ever seen and are not affected by carbide light. The second pair of legs, exceedingly long, are used as tactile organs. Several individuals of this species were caught in Little Wyandotte.

Phalangodes armata Tellkampf.—Two specimens of this cave harvestman were taken in Mammoth Cave, one at River Styx and the other at end of main cave. It is much larger and more active than the preceding species. It is usually found on the walls and not on the floor.

Chtonius Packardii Hagen.—One specimen of this small semiblind pseudoscorpion was taken in Wyandotte, two in Little Wyandotte and one in Mammoth. I have also taken it in Shawnee Cave. It is usually found under damp rocks. It moves along slowly with its chelæ held in the air in front, and is very difficult to find.

In order to keep the specimens from any of these caves alive very long, it was necessary to place them in a saturated atmosphere. They were most conveniently kept in small vials. One individual with a drop of water was placed in each vial. In such confinement several died in a few days, but the majority survived for a month or more. Light experiments like those with *Troglohyphantes* were prosecuted with *Theridium porteri* Banks and *Erigone infernalis* Keys., collected in Mayfield's Cave. They were decidedly negatively phototropic. Various outside forms

were likewise experimented with. Some of these were negatively, others positively phototropic. The kind of phototropism depends on the natural environments of the specimen. It was observed that the specimens collected on this trip always preferred the dark end of the vials. All true cave spiders are more or less negatively phototropic. The distribution and number of all true cave spiders are controlled by even temperature and the abundance of food. They probably have no enemies other than themselves and are rarely seen fighting. They soon die outside the caves unless kept in a saturated atmosphere.